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Smart Cities and Smart Tourism: Responding to the Demands of Modern Urbanization

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Abstract

In the fast-moving developmental world, the role of information and communication technology become very essential in almost all industries. Smart technologies reach into almost all aspects of life nowadays, although they are often unnoticed by users and taken for granted. Recently, tourism destinations have also started to implement smart technologies with the intention to enhance the experience of incoming tourists in response to the new EU goals to limit the ongoing climate change (Endesa, 2008). The technological advancement and immense use of ICT in tourism directs smart tourism in that direction only, even it has some other dimensions. Smart tourism also directs towards the innovative use of technology in resource optimisation, sustainability, good governance, and quality of life in the tourism industry. This paper defines smart cities and smart tourism and their importance and relevance todays context. Smart tourism is a rapidly growing concept in developed countries and in developed smart cities. The study focuses on the smart tourism practices in the smart city and, importantly, the prospects and challenges that come in the way of smart tourism are also discussed. This paper extends the previous research on smart tourism and draws attention to further study on smart tourism development and management.

Keywords: Smart tourism; Smart city; Destination smartness; Technology and tourism.

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1 INTRODUCTION

Smart is commonly the most popular term used to describe technology, social development, and the economy. And it has reached almost every aspect of life and is often unnoticed by users and taken for granted. Most smart technologies depend on sensors, big data, and new ways of connectivity between humans and machines, even with multi-device, networked exchange of information. The advance technologies in mobile and its role have supported the travel experience. Advanced technology and virtual reality have further increased the boundaries of how data can be collected and how it can be utilized. However, it is not so much the individual technological advances but rather the interconnection, synchronization, and concerted use of different technologies that constitute smartness.

In terms of tourism, smart technologies are changing consumer experiences, and it is making creative tourism business models. Cloud computing, big data, mobile apps, location-based services, geo-tag services, beacon technology, virtual reality, augmented reality, and social networking services are all cutting-edge examples of smart technologies enhancing the tourism experiences and services (Wang et al., 2012). Smart tourism permits for new ways of managing tourist flows, new advertising models, better tourist services, and new collaborative ventures that build on cloud services and open data to innovate beyond the traditional industry boundaries. There are many advantages of smart tourism.

Many research has shown that cities' tourist destinations need not emphasize the tourists' experience, but rather the enhancement of the living standards of its stakeholders, such as residents and local companies. The implementation of smart technologies is to make daily life more efficient and not only increase the tourist experience but enhancing the tourism destinations and travel experiences for cities.

2 LITERATURE REVIEW:

- Jasrotia and Gangotia (2018) reviewed the concepts of smart cities and smart tourism destinations and highlighted their strong interrelationship. The study suggests that smart cities provide the technological, infrastructural, and governance framework necessary for the development of smart tourism destinations. It emphasizes that smart tourism is an integral component of smart city initiatives, as cities leveraging ICT and innovation can enhance tourist experiences and destination management. The study also underlines the relevance of smart city development in India for achieving sustainable tourism growth.
- Sarji et al. (2023) examined the relationship between Smart Cities and Smart Tourism through a systematic review, emphasizing the role of smart city frameworks in achieving sustainable and competitive tourism development. The study highlights that Smart Tourist Cities emerge from the convergence of smart urban systems and tourism functions, where technology enhances urban services, quality of life, and destination competitiveness. The authors also map the current and future potential of tourism growth in Asia through smart city initiatives, while noting limitations

related to the narrow literature scope and exclusion of emerging technologies such as big data and virtual reality.

- Habeeb and Weli (2020) reviewed the emerging concepts of smart cities and smart tourism, emphasizing their growing importance in achieving sustainable and competitive tourism development. The study highlights that existing research on smart tourist cities remains limited in addressing their comprehensive development. By examining recent literature, the authors establish a strong conceptual relationship between smart cities and smart tourism, identifying smart cities as a fundamental driver for the growth and modernization of tourism destinations. The study further illustrates the potential for tourism development through smart city implementation, particularly in the context of Iraq, and concludes that smart tourist cities emerge from the convergence and integration of smart city
- Lee, Hunter, and Chung (2020) examine the development and transformation of smart tourism cities by focusing on the integration of smart technologies to enhance destination competitiveness. Their study highlights how smart tourism initiatives within smart cities can address negative perceptions of tourism by creating shared spaces that benefit both residents and visitors. The authors propose a conceptual framework that differentiates and connects the components of smart cities and smart tourism, offering a structured understanding of smart tourism city development. Additionally, the study emphasizes the importance of local and tourist interests, along with strong smart government leadership, as key factors in successfully implementing smart tourism strategies within urban environments.
- Upadhyaya (2016) addresses the foundational challenge of defining smart cities, emphasizing that a universal definition is not feasible due to variations in development levels, resource availability, and citizen aspirations across cities. The study argues that smart cities should focus on delivering core infrastructure and improving quality of life through integrated smart physical, social, institutional, and economic systems. Grounded in the Indian policy context, the paper highlights the government's commitment to urban transformation through substantial investments under the Smart Cities Mission and the AMRUT programme. However, the study represents an early-stage conceptual exploration, primarily outlining smart city components rather than providing empirical evaluation of implementation outcomes or comparative effectiveness.

3 RESEARCH GAP

Although extensive research exists on smart tourism in developed countries, there is a noticeable lack of comprehensive studies examining smart tourism within Indian smart cities. Limited research addresses the integration of smart tourism practices with smart city initiatives, stakeholder participation, and policy frameworks in India.

4 AIM OF THE STUDY

This study aims to examine the relationship between smart city initiatives and smart tourism development, with a focus on understanding how smart technologies can support sustainable and competitive tourism in the Indian context.

5 OBJECTIVES OF THE STUDY

- To understand the concepts of smart cities and smart tourism and examine their interlinkages.
- To analyze the role of smart city initiatives in facilitating smart tourism development, including key tools and practices.
- To identify the prospects, challenges, and policy measures required for sustainable smart tourism development in India

6 SMART CITIES

In smart city mission, the Government of India initially planned for 100 cities through smart city challenge by defining certain criteria and guidelines. Smart solutions were given importance in the guidelines in selection of the cities, such smart solutions categorised such as: e-governance and citizen service, waste management, water management, energy management, urban mobility etc (GOI, 2015). Cities were selected based on their profiles, awarded with a mark for different dimensions, and the selection of the cities was based on the ranking in smart city challenge.

Table 1 Ranking of smart cities in India

Rank No.	**Name of State/UT**	**Name of City**
1.	Odisha	Bhubaneswar
2.	Maharashtra	Pune
3.	Rajasthan	Jaipur
4.	Gujarat	Surat
5.	Kerala	Kochi
6.	Gujarat	Ahmedabad
7.	Madhya Pradesh	Jabalpur
8.	Andhra Pradesh	Visakhapatnam
9.	Maharashtra	Solapur
10.	Karnataka	Devanagari

Figure 1: Basic Elements of a Smart City

In 2015, the government of India launched the Smart Cities Mission.

The objective of the mission was to encourage sustainable and inclusive cities that provide essential infrastructure and to improve the quality of life to its citizens, a sustainable and clean environment, with the application of 'Smart' Solutions.

The main emphasis is on the sustainable development of the cities as a whole and concentrates on compact area and a model can be worked out for the implementation. The mission is to set the example that will stimulate inside and outside the city. Acting as a catalyst in creating similar smart cities in different regions of the country.

The main infrastructure elements of the smart city are services such as water supply, assured electricity supply, sanitation, as well as solid waste management, public transport, and effective urban mobility, affordable housing, connectivity and digitalization, worthy governance, sustainable environment, security, and safety of all citizens.

7 SELECTION PROCESS

According to the selection of smart cities, the idea of Competitive and Co-operative Federalism follows a Challenge process to select cities in two stages.

In January 2016, based on the All India Competition, 20 smart cities were selected in Round 1, and an additional 13 smart cities were selected in May 2016 in Annexure II . Maharashtra ranks second in selection. Pune city from the Maharashtra region was selected in smart city competition. A total 4 round was conducted for 99 cities under their smart city plans.

8 SMART TOURISM :DEFINING SMART TOURISM DESTINATIONS

The study and literature review on smart tourism destinations indicate that these tourism destinations are used boost the production and development of the tourism process (Wang, 2013).

Buhalis and Amaranggana (2014) in the paper "Smart tourism destinations" stated that in order to make tourism destinations smarter, there is a need to link the different stakeholders in it through a common platform.

Guo (2014), Wang (2013), and Zhu (2014), through their paper, have explained that the tourism destinations that utilize the available advanced technologies and value it, experience, and pleasure for the tourist. Smart tourism destinations need to involve the local stakeholders and community together.

Smart tourism destinations are helpful for the tourism industry as it enables to increase of the exchange of information between tourism organizations and tourists through a common platform. It can better understand the customers' actual needs and preferences.

In the todays scenario, technology play vital role, and tourism is the largest industry in the world in terms of economic generation and acts as a backbone for many industries. According to the UNWTO (2015), tourism is a "social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or www.ijcrt.org © 2018 IJCRT while information and technology play an important part in the tourism industry. It can be better understood by smart tourism as a natural progression of e-tourism. "Statistics on ICT use in Tourism" (2016) statistics data explains tourists prefer online services to book their travel plan than regular offline services. The percentage of tourists is increasing day by day. Smart and technology are interconnected. Combining tourism to the term, it can be understood as it directs towards smart destination development, smart experience, and smart business systems. Smart destination, smart business system, and smart expression of experience and information or data are considered as components of smart tourism (Vasavada & Padhiyar, 2016). Data is connected with the other three, and they are interconnected with each other through the collection, exchange, and processing of information. Though ICT plays an important role, smart tourism is not all about technology; it is about agility.

"Smartness is fostered by open innovation, supported by investments in human and social capital, and sustained by participatory governance, to develop the collective competitiveness of tourism destinations to enhance social, economic and environmental prosperity for all stakeholders and generate value for visitors." (Buhalis, 2013).

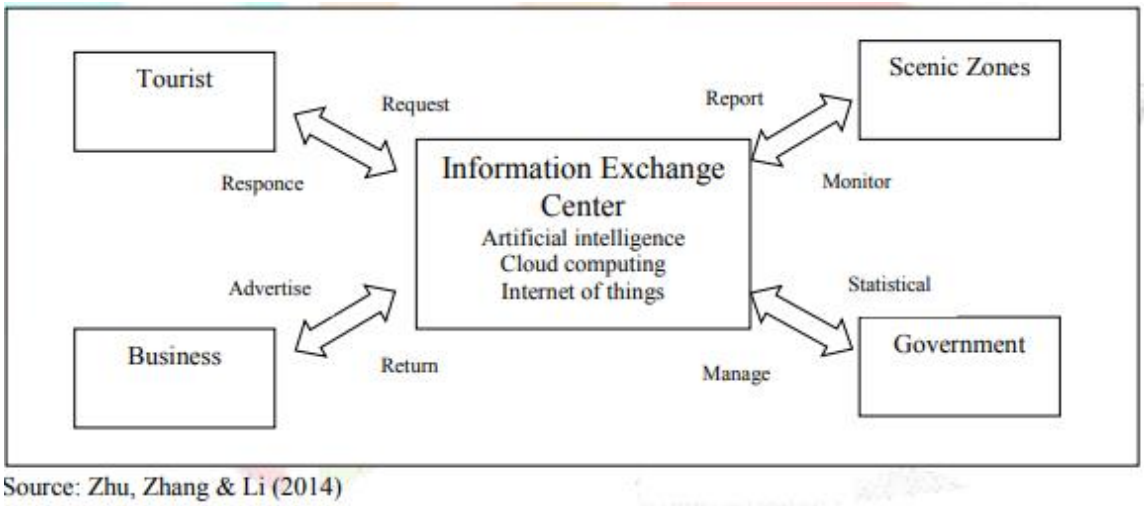

Fig: 2 structure of smart tourism

9 SMART TOURISM TOOLS

Smart tools in tourism can augment reality and enable visitors to experience different places, thus allowing travel guides to come to life in real-time locations (Chillon, 2012). Smart tools in tourism have both positive and negative aspects. Besides, it may be an attraction for foreign investment. And from a tourist point it can be beneficial if tools can be user-friendly as well as suitable. The important benefit of these tools will be to enrich the tourist experience. On the other hand, as it is connected to many things via the internet user will be easily trackable, vulnerable, and can be easily manipulated. As people are connected with portable devices this tools would even be further enhanced, and more time would be spent online, which can lead to a loss of social interaction in real life. However, technological advances can cause people to be diverted, overly stressed, and increasingly isolated (Human Kinetics, 2010). The more advanced technology becomes, the more it appears to control users' lives. Recent developments in technology, such as the internet also led to a decline in 'normal' social behaviours.

Another threat in this is the security risk. Weil (2013) outlines that hacking is not limited to computers and smartphones. This threat cannot be neglected as it is very serious. As these technologies are like two-edge sword, from connectedness and safety. Therefore, there need for a proper balance in order to use all the benefits and also threats to a minimum level.

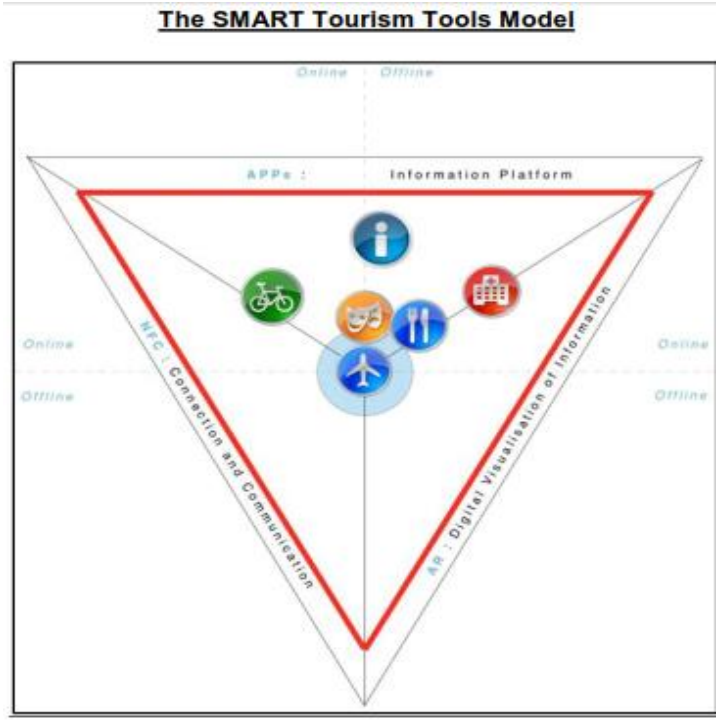

Figure 3: The interrelated triangle of smart tourism tools

Key (table 1):

Symbol	Reference to 6 A's of tourism destinations (Buhalis, 2000 as cited in Buhalis et al., 2013)		
	Attractions		Available Packages
	Accessibility		Activities
	Amenities		Ancillary Services

Smart Tourism Tools

10 SMART TOURISM TOOLS USED IN SMART CITIES

- **Integrated Smart City Mobile Apps** Smart cities use integrated mobile applications that combine tourism information with urban services such as transport, parking, emergency services, and events, providing a seamless experience to tourists and residents.
- **Smart Destination Management Systems (DMS)** These systems help city authorities manage tourist information, accommodation, attractions, events, and stakeholder coordination using centralized digital platforms.

- **GIS and GPS-Based Navigation Tools** Geographic Information Systems (GIS) and GPS technologies support smart wayfinding, route optimization, accessibility mapping, and real-time navigation for tourists within smart cities.
- **Smart Public Transport and Mobility Tools** Real-time transit information, smart ticketing, e-mobility services, and intelligent traffic management systems improve tourist mobility and reduce congestion.
- **IoT-Based Crowd and Infrastructure Management** IoT sensors are used to monitor crowd density at tourist spots, manage lighting, parking, waste bins, and environmental conditions to ensure safety and efficiency.
- **Digital Information Kiosks and QR-Based Systems** Smart kiosks, QR codes, and interactive displays provide multilingual information about heritage sites, city services, emergency contacts, and nearby amenities.
- **Big Data and Urban Tourism Analytics** Smart cities analyse tourism-related data from mobile apps, sensors, social media, and transactions to understand tourist behaviour, forecast demand, and improve planning decisions.
- **Smart Safety and Surveillance Systems** CCTV cameras, smart street lighting, and emergency response systems enhance tourist safety and support quick coordination with city authorities.
- **Immersive Technologies (AR/VR)** Augmented Reality and Virtual Reality tools enhance cultural, historical, and urban tourism experiences through interactive storytelling and virtual tours.
- **Digital Payments and Smart Ticketing Systems** Cashless payment systems, smart cards, and unified ticketing platforms simplify access to transport, attractions, and public facilities.
- **Sustainable Resource Management Tools** Smart energy grids, water monitoring systems, and waste management technologies support eco-friendly tourism and sustainable urban development.
- **E-Governance and Citizen–Tourist Feedback Platforms** Digital grievance redressal systems and feedback portals allow tourists to report issues, rate services, and interact with city authorities

11 CONCLUSION

Smart tourism has greater potential in smart cities. It can be estimated technology\y play vital role in smart tourism, so in the tourism industry, new and advanced technologies should be utilized to configure a new developmental scenario for tourism destinations in India that could favour in progression of smart tourism. And the cities where tourism is increasing should adopt the new technologies to have fast and integrated development of the city. There is a need to have collaborative efforts from the government and the tourism stakeholders for development. Moreover, all smart cities identified under smart city mission have tourism potential and need to be promoted through smart approaches. Smart city standing committees should come up with the needful strategies, and proper planning and monitoring should be followed to achieve those. As tourism needs long term development, policies should be framed which

includes development of overall road infrastructure for better accessibility, affordable accommodation and restaurants, accessibility to airports, uninterrupted access to basic amenities like water and electricity and Smart Tourism in cities Communication International airport Road and Rail connectivity Better informational communication services Infrastructure Hotel and restaurants Medical facilities Event management facilities Resources Heritage and Cultural resources Major events and festivals Market and Business hub Branding Number one in smart cities Capital.

Citizen views are important in the decision-making process, and during implementation, community participation should be encouraged. Smart tourism projects need to be marketed through smart media like advertising on TV and social media for widespread and better responses. The number one smart city of India needs to focus on the infrastructure developments in accommodation, water, and waste management

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